

# Simple Sugars and Complex Carbohydrates - An Incompatible Combination

By Steve Born



**Steve Born**

Steve's decade-plus of involvement in the sports nutrition industry, as well as nearly 15 years of independent research in nutritional fueling and supplementation, has given him unmatched familiarity with the myriad product choices available to athletes.

If you look on a container of a Hammer Nutrition fuel you'll find something that you'll probably not see on another energy drink or gel, a warning. For example, on a container of HEED you'll find these words: "Do not combine HEED with any product containing simple, refined sugars. Negative side effects may occur." Similarly, you'll find the following on a container of Perpetuem: "WARNING: Do not combine Perpetuem with any product containing simple, refined sugars."

What's up with that? Why are we so adamant about not combining simple sugars with complex carbs? Well, the reason for that is simple: we want you to enjoy your workout or race, we want you to achieve your best possible results, and we want you to do that without having stomach issues such as bloating, cramping, diarrhea, and a host of others. However, when you consume a simple sugar fuel at or near the same time as any of the Hammer Nutrition fuels (which contain no added simple sugars) you very much put your workout and race, and your stomach, in jeopardy.

Here's the deal: simple sugars (glucose, sucrose, fructose, dextrose, etc) need to be mixed in concentrations no higher than 6-8% in order to achieve an acceptable absorption osmolar value of body fluids (280-303 mOsm) and be digested with any efficiency. That's it. The problem is that a 6-8% solution is a pretty weak mix and will only yield about 100 or so calories an hour, which is inadequate for maintaining optimal energy production. Some athletes realize that and try to resolve the problem by making a double or triple strength batch of their simple sugar product. Unfortunately, that solution is now far too concentrated, it's much higher than 6-8% and, unless more water is consumed or added to the mix (at which point the athlete might very well be flirting with over hydration) that concentrated simple sugar solution will not pass the gastric channels. Energy production is compromised and stomach distress is sure to follow.

The same problem occurs when an athlete combines a simple sugar fuel with a complex carbohydrate fuel. The beauty of complex carbs is that they will match body fluid osmolality, not at a 6-8% solution, but a more concentrated 15-18% solution. Even at this seemingly too-high concentration complex carbohydrates (such as maltodextrins/glucose polymers) will empty the stomach at the same efficient rate as normal body fluids and provide substantially more calories (up to three times more) than simple sugar mixtures will. However, when simple sugars and complex carbs are consumed together or near each other, it increases the solution concentration beyond what either source can be efficiently

digested at. In other words, when you consume simple sugars and complex carbohydrates together or within close proximity of each other you negate the efficient digestibility of either source. Once again, energy production will be compromised and a variety of stomach issues are likely to occur.

**SUMMARY:**

1. If the athlete consumes a simple sugar fuel the body will only permit 6-8% of it in solution into circulating serum for fuel replacement.
2. Complex carbohydrate fuels are easily and more-rapidly absorbed in a 15-18% solution. More calories are absorbed faster, and are available for energy production, from complex carbohydrates than simple sugar.

The higher the simple sugar content, the higher the solution osmolality, the less of it is absorbed immediately. The longer the chain of sugars linked together as a complex carbohydrate the more of it is absorbed in higher solution because its osmolality is closer to that of body fluids. Therefore, the ideal carbohydrate source for athletes is long-chain complex carbohydrates, which is what all the Hammer Nutrition fuels are comprised of.

**BOTTOM LINE:** You don't want nor need to consume ANY simple sugars with any of the Hammer fuels. The Hammer fuels will meet all your energy needs and you won't have to worry about any stomach issues that can occur when you consume simple sugars with them.